

### REMARKS

By the *Office Action* of 1 July 2003, Paper No. 9, Claims 1-78 are pending in the Application, and all rejected. By the present *Response*, the Applicant respectfully submits that the present Application is in condition for allowance for the following reasons.

**1. Claims 1-17 And 39-57 Are Not Obvious In View Of Werner et al.**

In the first *Office Action* of 13 January 2003, Paper No. 7, Claims 1-18 and 39-57 were rejected under 35 U.S.C. § 102(b) as being anticipated by Werner et al., or rejected under 35 U.S.C. § 103(a) as obvious over Werner et al.

In the present *Office Action*, the Examiner has withdrawn the § 102 rejection over Werner et al., but maintains the § 103 rejection. The Applicant respectfully submits the obviousness rejection in view of Werner et al. is misplaced, as the Examiner does not provide a *prima facie* case of obviousness, a burden which the Examiner must meet.

The Examiner relies solely on the conclusory assertion that Werner et al. inherently discloses what is claimed by Applicant. Not only is Werner et al. silent on the subject matter and recitations of Claims 1-17 and 39-57, but Werner et al. in fact *teaches away* from the claimed invention. As such, it is submitted Claims 1-17 and 39-57 are novel and non-obvious over Werner et al.

It further appears that the Examiner's rejection to Claims 1-17 and 39-57 concerns itself only with the independent Claims 1 and 39. The Examiner does not provide specific rejections, and does not point to specific disclosure in Werner et al. to support the rejections, of the dependent Claim 2-17 and 40-57, each of which dependent Claim has other novel and non-obvious features over Werner et al. This is the second *Office Action* that appears to insufficiently support the rejection of Claims 2-17 and 40-57.

The Examiner suggests that Werner et al. discloses varying the thickness of the face of a golf club head, and that this, in and of itself, *inherently* teaches the Applicant's claimed subject matter of Claims 1-17 and 39-57, although these Claims are silent as to face thickness. The Examiner states:

Thus, it is inherent and obvious in view of Werner et al. that the face structure of Werner et al. has the flexural range or ranges similar to the claimed invention or at most thru routine optimization. *Office Action, Page 2.*

This characterization of Werner et al. is inaccurate, and this ground of rejection is not sound. First, the combination of inherency and obviousness as presented by the Examiner is not a strong rejection position - as inherency is really an anticipation rejection. As noted by the Board of Patent Appeals and Interferences:

[T]he examiner talks in terms of inherency (which is really an anticipation rationale) while on the other hand the examiner talks in terms that it would have been obvious to experiment to divine optimum conditions.

Inherency and obviousness are somewhat like oil and water - they do not mix well. 56 USPQ2d 1723, 1725 (BPAI 2000) (*unpublished*).

Second, there exists no "similarity" test for obviousness, although the Examiner appears to suggest from the earlier citation from the *Office Action* that if Werner et al. inherently teaches similar ranges of the present Claims, then the Claims are obvious.

Third, although inapposite to a finding of obviousness, Werner et al. does not disclose a "similar" range as stated by the Examiner, but *teaches away* from the range claimed by the Applicant.

Another flaw in the Examiner's obviousness rejection is apparent from the Examiner's characterization of the Applicant's invention. The Examiner states:

Werner et al. discloses a golf club head ... with variation of thickness in the face where the greatest thickness is at the center of the face plate .. and progressively thinner toward the edges of the face. ... *Such configuration is the same or very similar as the Applicant's invention. Office Action, Page 2. (emphasis added)*

Applicant's *invention* is defined by Applicant's Claims, and nowhere in any of the 78 pending Claims is there novelty or non-obvious related solely to the thickness of the faceplate. Applicant's invention is a novel and non-obvious range of flexure found through investigation and rigorous testing. The Examiner appears to reject the Applicant's *figures*, or *Specification*, relating to thickness of the face in embodiments of the Applicant's disclosure, but Applicant does not claim thickness.

It appears the Examiner neglects the notion that the Applicant's invention is recited in the Claims. Simply put, Applicant's Claims *do not recite* "a golf club head ... with variation of thickness in the face where the greatest thickness is at the center of the face plate .. and progressively thinner toward the edges of the face" as the Examiner suggests Werner et al. teaches.

The Applicant has invented a novel and non-obvious club that has a very particular range of flexure, while Werner et al. attempts to solve prior art limitations in head designs by providing wall thickness variations to provide a club head with a large face:

These considerations bring about a design limitation in the maximum size of face which will have adequate strength for withstanding impact of club head and ball. The present invention respects this limitation, while concurrently allowing club heads to have larger faces. *Col. 1, Lines 26-31.*

Frankly, that puts Werner et al. in the company of literally thousands who are working to adjust face thickness, arrangements of thickness, pitch, and other head characteristics to improve golf strokes. But to use Werner et al. to reject as obvious all future improvements in club heads that try to improve strokes is clearly improper. Werner et al. can only go so far to reject as obvious such future inventions.

But the present case is even more distinguishable, as the Applicant recites ranges of flexure, which ranges in the Claims are not limited to changes in thickness of the face, but could, for example, also be due to material characteristics of the face. The Claims are silent as to such causes of flexural ranges.

Not only as the BPAI spoken to the misapplication of the Examiner's conclusory inherency rejection, but the Federal Circuit also has provided guidance related to the present situation, where an Examiner improperly uses a reference to extinguish new innovations, as explained in Continental Can Co. v. Monsanto Co., 948 F.2d 1264, 1269, 20 U.S.P.Q.2D (BNA) 1746, 1749 (Fed. Cir. 1991), discussing inherency in the context of obviousness:

Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. [Citations omitted.] If, however, the disclosure is sufficient to show that the natural result flowing from the operation as taught would result in the performance of the questioned function, it seems to be well settled that the disclosure should be regarded as sufficient.

That the presently recited range of flexure "may result from the thickness ranges taught in Werner et al. is not sufficient" to reject the Claims. Not only does the Examiner fail to provide the *prima facie* case of obviousness in view of Continental Can Co. by the Examiner's conclusory statements that Werner et al. teaches or suggests Applicant's invention, but Applicant submits that Werner et al. *teaches away* from the claimed ranges of Applicant's invention.

Werner et al.'s disclosure is not sufficient to show that the natural result of very specific thickness adjustments to the face of a club would result in the specific range of flexure claimed by the Applicant. The Examiner thus violates the dictates of Contentintal Can Co.

The present Application illustrates that Werner et al. *teaches away* from the present invention, and this argument has not be rebutted by the Examiner. The *Specification* expressly notes that clubs with varying thickness face walls have, in fact, a very large range of flexure, and clearly outside the recited range of Claims 1-3. Tables 2-5 illustrate that even with varying thickness face walls, the range of flexure is quite wide, and well outside the range of Claims 1-3. Claims 1-3 *do not* recite that the clubs have a varying thickness of face wall, but that *a range of flexure is well managed*, and Tables 2-5 show that clubs like those in Werner et al. suffer the specific disadvantages the present Application attempts to overcome. As shown in *Specification*, Page 12, Line 29 - Page 14, Line 11:

Tables 2 to 4 show the thickness distributions of the models 1 to 3 respectively.

Table 2

Major axis (mm)	Minor axis(mm)	Thickness (mm)
10	5	3.0
15	7.5	2.9
20	10	2.8
25	12.5	2.7
40	20	2.6

Table 3

Major axis (mm)	Minor axis (mm)	Thickness (mm)
10	5	3.0
15	7.5	2.9
40	20	2.6

Table 4

Major axis (mm)	Minor axis (mm)	Thickness (mm)
5	2.5	2.6
7.5	5	2.7
10	7.5	2.8
12.5	10	2.9
40	20	3.0

Table 5 shows quantities of flexure (unit: mm) measured by applying loads to the points a, b and c of the models 1 to 3 along the major axes on positions of 0 mm along the minor axes.

Table 5

Position of Load in Direction of Major axis	unit (mm)		
	Model 1	Model 2	Model 3
0 mm Point a	0.428	0.443	0.478
10 mm Point b	0.296	0.307	0.338
20 mm Point c	0.206	0.214	0.172

As shown in Table 5, the model 3 exhibiting a quantity of displacement of 0.478 mm at the face center is displaced only by 0.172 mm, i.e. 37 % of the displacement at the face center, at the offset position of 20 mm. Consequently, the model 3 exhibits rather inferior bounce in an offset shot.

On the other hand, the models 1 and 2 having thicknesses reduced from the face centers toward the peripheries exhibit remarkably larger quantities of flexure of 0.428 mm and 0.443 mm at the face centers respectively as compared with a sample of the model 1 having a thickness of 3 mm shown in Table 1 with flexure of about 48 %, i.e. about half the quantities of flexure at the face centers, at the offset positions of 20 mm. Therefore, bounce of this type of golf club head in an offset shot can be improved by reducing the thickness of the face from the face center toward the periphery.

Table 5 of the present Application illustrates that varying the face wall thickness even .4 mm over 20 mm leads to a variation of flexure of 37% of the maximum quantity of flexure, *which is outside the limits of Claim 1*. The variation of face wall thickness in Werner et al. is 1.78 mm as shown in Fig. 3 over 50+ mm, and .26 mm over 20 mm. There is simply no teaching in this reference that such variations of face wall thickness would provide the range of flexure as recited in the Claims. Further, the wall thicknesses of Werner et al. are from 6.86 to 5.08 mm, while the wall thickness in Tables 2-4 range from 2.6 mm to 3.0 mm.

The present invention is an improvement over a Werner et al.-type club head. Werner et al. simply discloses a club with a varying thickness face wall, and provides one example of such thickness changes. The present invention provides a wall face of a club that has a specific range of flexure. In fact, Claims 1 and 39, the only independent Claims, *do not* recite any limitations as to face wall thickness, but only to a very precise range of flexure. Werner et al. is silent on ranges of flexure, and it is respectfully not clearly understood how such silence in the reference can provide a § 103 rejection, particularly one that relies on inherency.

The object of Werner et al. is to provide a face wall formed to realize maximum face strength with minimum face mass. As such, Werner et al. discloses a face wall that has a varying thickness. That is it, and that puts the reference in the company of many prior art references that disclose varying the face wall thickness of a club. But this is not what is claimed in the present Application. The present invention is concerned with, and the Claims specifically recite, limitations as to variations in a range of flexure of the face. That Werner et al. attempts to provide a larger sweet spot by varying the face wall thickness is a long way from disclosing the present invention's use of limiting the range of flexure in the face.

As to the dependent Claims, Werner et al. discloses no specifics as to sweet spot size or configuration, discloses no specifics on flexural ranges, discloses no specifics on spring constants. The *only* specifics Werner et al. provides is a depiction of varying thickness of the wall face shown in Fig. 3.

The Werner et al. reference is no different in presenting a club with varying face wall thickness than prior art discussed in the present Application, which is decidedly distinguished by the present Claims. For example, a varying thickness wall is disclosed in Japanese Patent Laying-Open No. 9-192273, as disclosed in the Application:

Japanese Patent Laying-Open No. 9-192273 (1997) discloses a golf club head of a metal according to second prior art, which is provided with a face center part in a thickness having sufficient strength for withstanding impact applied by collision with a golf ball and a peripheral part having a smaller thickness than the face center part. *Specification, Page 1, Lines 18-21.*

At least one distinction between this Japanese reference and the present invention, which is similar to the distinction of the Werner et al. reference, is that the change in face thickness is *not* related to a specific range of flexure, *nor* an elliptical hitting zone:

In the golf club head according to the second prior art (Japanese Patent Laying-Open No. 9-192273), the peripheral portion is not arranged in response to the hitting point distribution of the player either and hence the carry of a golf ball is remarkably reduced by an offset shot although the ball carries enough when hit at the face center of this golf club head. *Specification, Page 3, Lines 15-19.*

That Werner et al. discloses varying thickness of the face wall provides *no insight or teaching* of the recitations of Claim 1 of the present Application, that

- a flexural range, defined in the face of the head, has a *range of quantity* of flexure in a direction perpendicular to the face of at least 45%, and not more than 95%, of

the maximum quantity of vertical flexure of the face (the term "flexural range" stands for a partial region of the face flexed in excess of a prescribed quantity when a vertical load exceeding a prescribed value is applied to the face), or

- a flexural range *arranged* according to a hitting point distribution range of a player in the face.

Neither of these limitations are taught in Werner et al., nor are they inherent in the club of Werner et al. Werner et al. is silent to both of these recitations of Claim 1.

Even if the Examiner maintains the rejection of Claim 1 by holding that Werner et al. teaches a range of flexure of between 45%-95% of maximum flexure, Applicant respectfully submits the Examiner once again fails to properly support a rejection of the dependent Claims, that, for example, even narrower ranges of flexure recited in Claims 2 and 3 (70%-95% and 90%-95%) are obvious, as these ranges surely are not disclosed in the Werner et al. reference, and are not simply design characteristics inherent in the Werner et al. reference club.

Other of the presently § 103 rejected Claims go even further in defining the shape, location, and other characteristics of the flexure range, and such recitations are not shown in Werner et al. The flexural range is the region enclosed within the ellipse 16 of, for example, Figs. 7-23. The present Application places preferred size and location limits of the flexural range, for example:

Therefore, the area of the flexural range having the aforementioned spring constant is at least 75 mm<sup>2</sup> and not more than 1260 mm<sup>2</sup>, preferably at least 75 mm<sup>2</sup> and not more than 707 mm<sup>2</sup>, and more preferably at least 75 mm<sup>2</sup> and not more than 314 mm<sup>2</sup>. Further, the area of the flexural range is preferably at least 3 % and not more than 50 % of the area of the face 2, and more preferably at least 5 % and not more than 30 % of the area of the face 2. *Specification, Page 18, Lines 9-15.*

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The area of a hitting point distribution of a low handicapper is about 150 mm<sup>2</sup> and that of a hitting point distribution of the general player is 1500 mm<sup>2</sup>, and hence the area of the flexural range is preferably 150 to 1500 mm<sup>2</sup>. *Specification, Page 18, Line 31, Page 19, Line 1.*

Various of the Claims recite specific location and sizes of the flexural range, which recitations are not disclosed in Werner et al. For example, Claim 6 recites an inclination of a major axis of the flexural range, again to which Werner et al. is silent.

Applicant respectfully traverses this rejection as Werner et al. neither teaches nor suggests a flexural range as limited by the present Claims, as fully described above. While it is

no doubt the intent of Werner et al. to provide a larger hitting face on a club, it simply does not provide a teaching of limiting the flexural range to a percentage of a maximum quantity of vertical flexure or of a spring constant. (All Claims).

## 2. Claims 18-38 and 58-78

Claims 18-38 and 58-78 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Werner et al. in view of two Kosmatka references, the '603 and '868 references. Applicant respectfully traverses these grounds of rejection, as it is above-noted that Werner et al. does not make obvious Claims 1-17 and 39-57, and thus cannot be combined with the Kosmatka references to reject Claims 18-38 and 58-78.

Further, what the Examiner suggests the Kosmatka references teach is exactly *opposite*, and *teach away* from, the Claims as modified in the Applicant's 30 April 2001 *Response and Amendment*.

In the previous *Response and Amendment*, Claims 18, 25, 58 and 65 were amended to recite that plurality of peripheral regions are either *non-concentric*, or *non-elliptical*. Such an arrangement of peripheral regions is neither taught nor suggested in the cited art.

In the club heads of the present invention as illustrated in Figs. 9-12, 14-17, 19, 21, 23-51, as examples, the regions 140, 141, 142 and 143 are *non-concentric*, *non-elliptical* regions of constant thickness, wherein in some embodiments the face *will not* have a symmetrical face thickness. The regions 140-143 are discrete regions, not annular, nor stacked one within the other.

The Examiner cites Fig. 1 of the '603 reference, and Figs. 1B and 1C (it is believed this is supposed to be 2B) of the '868 reference to reject the Claims.

Fig. 1 of the '603 reference could not be clearer in showing concentric peripheral regions - region 26 *within* region 28 *within* region 30 *within* region 32, etc. This is precisely what the present Claims exclude, as the present Claims have peripheral regions that are *non-concentric*.

Similarly, Figs. 1B and 2B of the '868 reference could not be clearer in showing concentric peripheral regions - region 2A *within* region 2B *within* region 2C *within* region 2D, etc. This is precisely what the present Claims exclude, as the present Claims have peripheral regions that are *non-concentric*.



### 3. Fees

No Claims fees are due, as the total number of Claims remains unchanged by the present *Response*.

Further, this *Response* is being filed within three months of the *Office Action*. Thus, it is believed no extension of time fees are due.

Nonetheless, authorization to charge deposit account No. 20-1507 is given herein should fees be due.

### CONCLUSION

By the present *Response*, the Application has been in placed in full condition for allowance. Accordingly, Applicants respectfully request early and favorable action. Should the Examiner have any further questions or reservations, the Examiner is invited to telephone the undersigned Attorney at 404.885.2773.

I hereby certify that this correspondence is being submitted via facsimile to the fax number for Group Art Unit 3711 of the United States Patent and Trademark Office at 703.872.9302 addressed to: Mail Stop Non-Fee Assessment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this date: 23 September 2003

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